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TO THE
RIGHT HONOURABLE
ARTHUR
EARL of ANGLESEY

One of the LORDS of His Majesties most Honourable
Privy Counsel, &c.

My Lord,



OUR Lordships many favours towards me, and mine own engagements to record the modern Resuscitations and Advancements of the Philosophical Sciences, for which you have alwaies shew'd a more than Ordinary propension, do, in all respects, both oblige and encourage me to dedicate this Volume of Philosophical Transactions to your Lordship.

My Lord, it hath been reported, that Philosophy and all kinds of polite Literature have commonly retired to the obscurest recesses, for shelter from the noise of War, and have expired or been almost extinguish'd by publick Calamities. But these our Generous Philosophers, whom I have devoted my services to, held out in all the Combustions of our former Wars, when our potent Neighbors assaulted us on all sides, and when the Pestilence and Fire had wasted our Mother City. And they brought in not a few additions of Materials and Aids, to all that had been essay'd in former Ages, or had been invented or prosecuted by the modern enterprizes of those admirable Men, our Gilbert, Galilæus, our Lord Bacon, Peyreske, Torricellius, Gassendus, Des-Cartes, Harvey, and many others worthy of everlasting monuments. These were bright Stars of the first magnitudes; yet their greatest Designs were lately illustrated, enlarged, methodized, and, some way or other, improved to more maturity and perfection; as may be seen in the History of the R. Society, and sometimes more particularly in the rude Miscellanies of these Transactions.

So much have the noblest Arts flourish'd amongst us ever since His Majesties most auspicious Restauration (partly by the recovery of Antiquities, partly by recent aides, and successful Inventions,) even in these roughest times of publick conflicts, that it may remain for a sufficient proof, that this Practical Philosophy is not an effeminate or effete study,

study, but efficaciously serviceable, under the heaviest incumbrances, as well for the defence of our King and Country against hostile Invasions and Encroachments, and for supply of necessaries for life, health, and strength in War. as for Accommodations, Elegancies and Ornaments in times of Peace and Prosperity.

'Tis manifest, that the Mathematical and Mechanical Arts are no less seasonable in these our Collisions for the skill and security of Navigation; and for Naval Architecture; for Engins, Fortifications, Artillery, and the modern Tactics: Medicine and Chirurgery for the recovery of decayed health, and the healing of lost or wounded limbs; Agriculture for sustenance; and, in remembrance of the old Heroes, I may add Martial Music, to excite Courage: and other Old and New Inventions proper to furnish other advantages: Then softer Delicacies are fit for treatments, satisfactions and political endearments in the establishment of safe and peaceable Government. An Archimedes may as justly deserve applause for his stout defence of Syracuse, as Phidias for the tender touches of his Chisel in fashioning the Portraits of Jupiter and Minerva.

And 'tis by the Intelligent acknowledged, That there are, at this day, a great number of more excellent Artificers, in almost all kinds of Works, which are deduced from the Ingenious Arts, for strength and beauty, and for all necessaries and all curiosities, than, I think, were ever before seen in England; and that these Arts cou'd not have grown so soon to such height, if his Majesties extraordinary Magnificence and the Public Exigences had not concurr'd to excite almost an Universal Industry. By the divine conduct, immediately after His Majesties return, his Countenance and his own great Example in Repairing and Adorning his Royal Palaces, and in strengthening and increasing his Navy; and his Royal Grant of a Charter to establish the Royal Society (according to Cicero's sentence, Honos alit artes:) All these encouragements made the way, and prepar'd skilful Masters and Guides, to survey, direct and promote all splendid Structures and Embellishments, which are now so conspicuous in the chief places of this Kingdom; and the abundance of goodly Ships, which do now ride in all our navigable Rivers and in all our Seas.

But I must decline a Task too hard for my pen, and too great for my leisure; and shall humbly present before your Lordships eye a closer and shorter view of some particulars contain'd in this small Volume. Astronomy, and other chief parts of the Mathematicks; and a diligent search into the depths of nature, into the nature of Animals, Vegetables, and all simples, Compounds and Mixtures, were the business, and in
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some manner appertain'd to the devotion of the Mighty Monarchs, Patriarchs and Wise men of the East. Here we have an account of several Novelties in the Heavens, and Changes in the Fixed Stars; the Orbits of the Planets, and the Periods of their rotations, in a sure way to be ascertain'd to the minutest measures of Time and Place. A Comet was seen, though but by a few, in the Spring of this Year; Here his appearances and motions are diligently calculated. The Abstrusities of Mathematicks in several points rendred easie. Brief and easie methods of Tangents for many uses. Algebraical additions, and a Body of Algebra under hand. Music open'd Philosophically, Mathematically and Practically. Opticks gave us the advantage above our Ancestors for the view of things present and at remotest distance: Here we are offer'd fresh accomplishments of Opticks and Perspective; and a Reflecting Telescope, which promieth and is like to perform more than has hitherto been attained by any approaching proportion of Measure. Light and Colors shew us all the beauty of this our world: much hath been done lately, with great success, to indicate the nature of both, beyond all expectation. And here we have second Advises of the nature of both; that Light is not absolutely pure, but heterogeneous; It hithe-ness not simple, but an Aggregate of all Colors. Light resulting from decay, both before it be sensibly putrified, and when it is putrified. Here Anatome searches near to the Originals of Animal-propagation, and of human contexture; dissects also the Veins of Vegetables, and there finds something analogous to Blood and Sence. Our Scarborough-Spaw is again anatomised spagyrically: And the Aponensian Baths of Italy, long ago admired by Livy and Claudian, are here re-examin'd. Common Stones are required to shew the Causes and Cure of the tormenting Calculus; concerning which here is found an instance of one bred under the tongue of a man. The Origin and Virtues of Gems are carefully discuss'd. Chymistry is here freed from the smuttiness of smoking vapors, performing much without fire, meerly by curious waies of Digestion, Fermentation, and Grinding. The Medicines of best note, and tryed, extracted out of 117 Authors, and reduced to an Alphabet of 410 Diseases. Here is a learned Account of the late Plague in London; of the Epidemical and Vernaculous Diseases of Eng'land and Wales; the peculiarity of our Air, Soil and Water: Also a Work of Chirurgery and Anatome, with a Breviate of the Plague in Holland.

Here Potatiques are discriminated, ranged, and explicated by the most Essential indications of Nature. The Culture of Vegetables appropriated for Orchards by one; and by another enlarg'd from the Flowry Garden to the Common fields and pastures. New England and

the other English Plantations in America acquaint us with their Vegetables and other rarities, chiefly for Medicine and Chirurgery. Kermes found to be in England, and Cochineil a kind of Kermes. The dancing Poyson of the Tarantula-Spider and the Muscal cure disbeliev'd in Otranto and Calabria, their proper places. The manner how the bitings of Vipers do poison, with great diligence examin'd in Italy; their result more than once contradicted in France. The Lake Lemain, and the Rhine runing through it; some Fish Canonizing there, some Wanderers, and many remarkables, accurately described. The Winds, in all their guises, by Sea and Land traced to their Originals. Prognosticks, Remedies or Preventions of Dearth and mortalities propos'd. Registers of Weather past, of price of Corn, human Births and Burials. solicited.

Here are some elaborate researches made into the Prerogative of Mans Mind; the pretences to knowledge in Beasts; the Souls of Brutes; the manner of Sensation, and Animation; into all the curious Motions in nature, perceptive, appetitive, vital. The poyses of Gravitation are here weigh'd in Philosophical Scales both relatively and positively. The operations, which the varying Weight of the Atmosphere may have even upon Mens Sickneß or health, are inquired into.

And for Voyages, a Parisian hath begun to give us the fourth Part of his Collections, relating to the Spanish Provinces in America: And two English Travellers have enricht us with their Observations of the Low-Countries, France, Germany, Helvetia, Grisons, Italy, Sicily, Malta and Spain. General Geography compleated beyond what others were aware of.

My Lord, I am sensible, I have gone beyond the bounds of an Address, presuming on your Lordships patience, whilst I endeavor (as in your presence) to satisfy such as are pleas'd to accept of the best satisfaction I am able to offer, and which is, I think, sufficient to prove, that knowledge grows on daily, more and more, and that our motion perseveres to be progressive. And your Lordship well knows, (and our Registers partly publish'd, partly reserv'd, do testify it,) that the Designs of his Majesties Royal Institution receive good assistance and applause from the most Eminent in the chief parts of the World, and is either encourag'd or emulated by most of the Kings and Princes in Europe. May this Royal Society, and the Noble Sciences ever flourish; and may your Lordship, and all, that favor these obliging Designs, ever prosper. So wisheth,

My Lord,

Your Lordships

Very humble and obedient Servant,

Henry Oldenburg, Soc. Reg. Secr.